

## Success Stories

For more than 70 years CHL has excelled as an unparalleled research facility. Our goal remains what it has always been - give sponsors the best solutions to their problems that have the greatest positive economic impact. Real world examples of this commitment include -

**Los Angeles, CA** - Hydraulic model studies of a flood control project in an urbanized area resulted in construction savings of at least *\$300 million*.

**Schofield Army Barracks, HI** - Avoided over *\$10 million* in groundwater remediation costs through application of the DoD Groundwater Modeling System site simulation.

**St. Paul Harbor, AK** - Physical model study allowed harbor expansion while protecting environmentally sensitive salt lagoon and reducing cost by *\$1 million*.

**Shinnecock Inlet, NY** - Numerical modeling of inlet dynamics resulted in reduced dredging, maximized dredged material placement and reduced erosion on down-drift beaches. Annual savings exceed *\$500,000*.

**Gray's Harbor, WA** - Jetty study reduced bayside erosion and will save *\$3 million* over next 10 years by reducing operation and maintenance costs.

**RIB** - RIB (Rapidly Installed Breakwater) for military Logistics-Over-The-Shore operations reduces an inoperable sea state 3 (a war stopper) to an operable sea state 2, allowing equipment/supplies needed by Army troops ashore to be offloaded.

**Defense Depot, Memphis, TN** - Numerical modeling of subsurface used to optimize a groundwater remediation effort. Cost savings are estimated to be *\$5-10 million*.

**Operation Joint Endeavor** - DoD Watershed Modeling System employed during OPERATION JOINT ENDEAVOR (Bosnia) to predict river stages for entire region. Allowed safer, more efficient troop movement.

**Columbia River, OR/WA** - 1:25- and 1:12-scale models of McNary Dam used to develop an overall design that improved the juvenile salmon passing efficiency from 50% to 85%, with a 99% survival rate.

**Tom Beville Lock & Dam, AL** - 1:100-scale physical model used to alleviate problems from cross current at upstream entrance during high flow conditions. Increased overall efficiency and safety levels.

## CHL Overview

The Engineer Research and Development Center (ERDC) is the Department of Defense (DoD) leader in civil engineering and environmental quality research and development (R&D). ERDC's Coastal and Hydraulics Laboratory (CHL) is internationally renowned for its: **WORLD-CLASS PERSONNEL** - a multi-disciplinary, 250-member team with the established experimental and computational expertise needed to solve a water resources problem anywhere; **UNMATCHED FACILITIES** - the physical and computational facilities and resources required to tackle any water resources problem; and **CUTTING-EDGE PRODUCTS** - the state-of-the-art technical products, ranging from design guidance to three-dimensional numerical models, needed for water resources problems at any scale.

Our research addresses the entire spectrum of water resources challenges in groundwater, watersheds, rivers, reservoirs, estuaries, harbors, coastal inlets and wetlands. This research also provides the basis for management and restoration of upland, riverine, estuarine and coastal ecosystems. We perform this R&D in support of concerns ranging from strategic activities of U.S. military forces to Army civil works. Our list of clients includes multiple Corps of Engineers and DoD sponsors, the Department of Energy, the U.S. Environmental Protection Agency, the Federal Emergency Management Agency and the Tennessee Valley Authority. We also work closely with a number of state, local and foreign governments along with many private research sponsors. Our engineers are currently involved in over 200 different research projects around the world.

## Points of Contact

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# Coastal and Hydraulics Laboratory



**US Army Corps  
of Engineers®**  
Engineer Research and  
Development Center



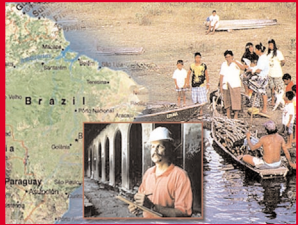
## Navigation



We help our clients create navigation projects that are safe, reliable, efficient, and environmentally responsible. We do this through research and development on safe, effective navigation channels and locks; stable inlets and shorelines; efficient, environmentally sustainable dredging and disposal of sediment; methods to reduce channel and harbor sedimentation; and the

impacts of navigation on the environment. We perform field investigations to characterize waterway conditions and ship and tow behavior. We develop physical and numerical models that simulate the movement of water, sediment, salt and other materials, and we develop ship and tow simulation models, all to provide reliable information to decision makers.

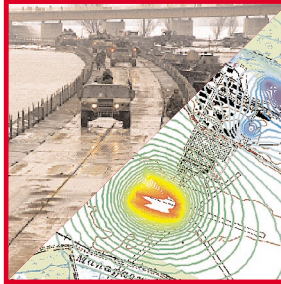
## Supporting Others



We welcome and encourage opportunities to support an ever-broadening range of national and international clients and partners. We are

experienced in working on water resources problems for foreign governments and U.S. firms operating abroad, and in support of NATO and U.S. peacekeeping activities.

## Military Support



Assisting the warfighter is of preeminent importance in our mission. Work includes remote precipitation sensing, predictive modeling of the onset/extent of battlefield flooding, visualization of results in dam break analyses, and water location in arid/semi-arid regions. Major advances have been made in the areas of riverine/coastal hydrodynamic analyses in support of ship-to-shore logistics and warfighter operations and mission planning. We also provide technology support to the military modeling and simulation community.

## Hydro-Environmental



We provide modeling technologies to a host of agencies that have significant water and natural resource stewardship responsibilities (e.g., habitat management for threatened and endangered species). Failure to properly care for these resources directly affects civil works projects and military training, readiness and environmental security. We develop and maintain state-of-the-art modeling and assessment technologies in support of coastal/inland habitat restoration, water quality maintenance, risk management, optimal site cleanup, watershed management and environmentally sustainable activities on military installations. We have forged numerous partnerships, public and private, to enhance our state-of-the-art capabilities in this area.

## Flood/Storm Damage Reduction



Flood/storm damage reduction planning and implementation are integral to our mission. We play a vital role in properly planning, engineering, constructing, operating and maintaining Corps-built projects. We do this through the development of cost-effective, risk-based design criteria for these projects. Such projects as dams, levees, channels and coastal structures are a primary line of defense against flooding for downstream and/or coastal areas. They also provide water supply storage, electricity, irrigation, recreational outlets and fish/wildlife ecosystems. We develop and maintain the technology base to assess the flood-carrying capacity of rivers as large as the Mississippi as well as urban, man-made, high-velocity channels. In addition, we develop and apply the technology to assess coastal storm surge and wave climate resulting from a variety of differing storms, including hurricanes.

## Integrated Systems Analysis



The demands of differing stakeholders often result in conflicts between desired uses of water and natural resources. Increasingly, it is necessary to consider the trade-offs between differing project purposes (e.g., flood control, environmental quality, navigation, etc.) when evaluating differing management alternatives. We provide a series of decision support aids and state-of-the-art modeling systems that support alternative evaluation and trade-off analysis at the single project, watershed and basin scales. These tools give single-point-of-access to models and analysis methods, visualization, conceptualization, and data management technologies. The tools can be used across a wide variety of computing environments, ranging from personal computers to workstations to supercomputers, as a function of the particular problem being assessed.

